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21 [A powerful strategy for deriving efficient programs by transformation](#)



Alberto Pettorossi

August 1984

Proceedings of the 1984 ACM Symposium on LISP and functional programming

Publisher: ACM Press

Full text available: [pdf\(691.69 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We present a method for deriving efficient iterative programs by transformation from recursive equation specifications. It consists of two phases: i) the transformation of general recursive programs into linear recursive ones, and ii) the transformation of linear recursive programs into iterative ones. In the first phase we apply the "tupling strategy" studied in [BUD77, Pet77], and implicitly used by other authors in the area of program transformation. That strategy ...

22 [Composing schema mappings: Second-order dependencies to the rescue](#)



Ronald Fagin, Phokion G. Kolaitis, Lucian Popa, Wang-Chiew Tan

December 2005

ACM Transactions on Database Systems (TODS), Volume 30 Issue 4

Publisher: ACM Press

Full text available: [pdf\(466.58 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A schema mapping is a specification that describes how data structured under one schema (the source schema) is to be transformed into data structured under a different schema (the target schema). A fundamental problem is composing schema mappings: given two successive schema mappings, derive a schema mapping between the source schema of the first and the target schema of the second that has the same effect as applying successively the two schema mappings. In this article, we give a rigorous semantic ...

Keywords: Data exchange, certain answers, chase, composition, computational complexity, conjunctive queries, data integration, dependencies, metadata model management, query answering, schema mapping, second-order logic, universal solution

23 [Data conversion and restructuring: Main schema-external schema interaction in hierarchically organized data bases](#)



A. G. Dale, N. B. Dale

August 1977

Proceedings of the 1977 ACM SIGMOD international conference on Management of data

Publisher: ACM Press

Full text available: [pdf\(723.91 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

A class of external schemas derivable from a tree structured main schema is identified. It is shown that the properties of this class of schemas permit the construction of a processing interface such that predicates defined on an external schema can be evaluated in an occurrence structure disciplined by the main schema.

24 [Communication design for electronic negotiations on the basis of XML schema](#)



Michael Ströbel

April 2001

Proceedings of the 10th international conference on World Wide Web

Publisher: ACM Press

Full text available: [pdf\(214.16 KB\)](#)Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: XML, application framework, electronic negotiation, ontology

25 Making object-oriented schemas more expressive

Diego Calvanese, Maurizio Lenzerini

May 1994

Proceedings of the thirteenth ACM SIGACT-SIGMOD-SIGART symposium on Principles of database systems

Publisher: ACM Press

Full text available: pdf(1.30 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Current object-oriented data models lack several important features that would allow one to express relevant knowledge about the classes of schema. In particular, there is no data model supporting simultaneously the inverse of the functions represented by attributes, the union, the intersection and the complement of classes, the possibility of using nonbinary relations, and the possibility of expressing cardinality constraints on attributes and relations. In this paper we define a new data ...

26 Maximizing reusability: seeking appropriate positions for derived classes within the class hierarchy

Reda Alhajj, Faruk Polat

March 2000

Proceedings of the 2000 ACM symposium on Applied computing - Volume 1

Publisher: ACM Press

Full text available: pdf(478.27 KB)

Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: algorithms, class hierarchy, maximizing reusability, object-oriented databases, schema evolution

27 A survey of approaches to automatic schema matching

Erhard Rahm, Philip A. Bernstein

December 2001

The VLDB Journal — The International Journal on Very Large Data Bases, Volume 10 Issue 4

Publisher: Springer-Verlag New York, Inc.

Full text available: pdf(196.22 KB)

Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

Schema matching is a basic problem in many database application domains, such as data integration, E-business, data warehousing, and semantic query processing. In current implementations, schema matching is typically performed manually, which has significant limitations. On the other hand, previous research papers have proposed many techniques to achieve a partial automation of the match operation for specific application domains. We present a taxonomy that covers many of these existing approach ...

Keywords: Graph matching, Machine learning, Model management, Schema integration, Schema matching

28 A common schema for dynamic programming and branch and bound algorithms

Paul Helman

January 1989

Journal of the ACM (JACM), Volume 36 Issue 1

Publisher: ACM Press

Full text available: pdf(2.72 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A new model for dynamic programming and branch and bound algorithms is presented. The model views these algorithms as utilizing computationally feasible dominance relations to infer the orderings of application objects, thereby implicitly enumerating a finite solution space. The formalism is broad enough to apply the computational strategies of dynamic programming and branch and bound to problems with nonassociative objects, and can model both oblivious and nonoblivious algorithms, as well ...

29 Document structure and content analysis 2: Schema matching for transforming structured documents

Aida Boukottaya, Christine Vanoirbeek

November 2005

Proceedings of the 2005 ACM symposium on Document engineering DocEng '05

Publisher: ACM Press

Full text available: pdf(441.70 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Structured document content reuse is the problem of restructuring and translating data structured under a source schema into an instance of a target schema. A notion closely tied with structured document reuse is that of structure transformations. Schema matching is a critical step in structured document transformations. Manual matching is expensive and error-prone. It is therefore important to develop techniques to automate the matching process and thus the transformation process. In this paper ...

Keywords: document structure transformations, schema matching

30 Resolving semantic heterogeneity in schema integration

Farshad Hakimpour, Andreas Geppert

October 2001

Proceedings of the international conference on Formal Ontology in Information Systems - Volume 2001

Publisher: ACM Press

Full text available: pdf(1.24 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Interoperability and integration of data sources are becoming ever more important issues as both, the amount of data and the number of data producers are growing. Interoperability not only has to resolve the differences in data structures, it also has to deal with semantic heterogeneity. *Semantics* refer to the meaning of data in contrast to syntax, which only defines the structure of the schema items (e.g., classes and attributes). We focus on the part of semantics related to the ...

Keywords: database integration, formal ontologies, semantic heterogeneity

31 Decidable Properties of Monadic Functional Schemas

Edward Ashcroft, Zohar Manna, Amir Pnueli

July 1973

Journal of the ACM (JACM), Volume 20 Issue 3

Publisher: ACM Press

Full text available: pdf(711.41 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

A class of (monadic) functional schemas which properly includes "Iarov" flowchart schemas is defined. It is shown that the termination, divergence, and freedom problems for functional schemas are decidable. Although it is possible to translate a large class of non-free functional schemas into equivalent free functional schemas, it is shown that in general this cannot be done. It is also shown that the equivalence problem for free functional schemas is decidable. Most of the resu ...

32 An efficient method for checking object-oriented database schema correctness

A. Formica, H. D. Groger, M. Missikoff

September 1998

ACM Transactions on Database Systems (TODS), Volume 23 Issue 3

Publisher: ACM Press

Full text available: pdf(261.72 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Inheritance is introduced in object-oriented systems to enhance code reuse and create more compact and readable software. Powerful object models adopt multiple inheritance, allowing a type (or class) definition to inherit from more than one supertype. Unfortunately, in applying this powerful modeling mechanism, inheritance conflicts may be generated, which arise when the same property or operation is defined in more than one supertype. Inheritance conflicts identification and resolution is ...

Keywords: databases, graph theory, inheritance conflicts, inheritance process, object-oriented database schemas, recursive types

33 Schema transformation without database reorganization

Markus Tresch, Marc H. Scholl

March 1993

ACM SIGMOD Record, Volume 22 Issue 1

Publisher: ACM Press

Full text available: pdf(542.87 KB)

Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

We argue for avoiding database reorganizations due to schema modification in object-oriented systems, since these are expensive operations and they conflict with reusing existing software components. We show that data independence, which is a neglected concept in object databases, helps to avoid reorganizations in case of capacity preserving and reducing schema transformations. We informally present a couple of examples to illustrate the idea of a schema transformation methodology that avoi ...

34 Database design: Entity-relationship approach to the conceptual schema design

Hirotaka Sakai

May 1980

Proceedings of the 1980 ACM SIGMOD international conference on Management of data SIGMOD '80

Publisher: ACM Press

Full text available: pdf(725.79 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

The purpose of this paper is to present a systematic approach to the conceptual schema design. The entity-relationship model is used as the conceptual schema model. The entity-relationship schema, a formal description of the model, is defined to explicitly state the dependency structures such as the functional dependencies, the transitive dependencies, and the hierarchical decompositions. Based upon the analysis of these structural properties, the schema is iteratively transformed into the refin ...

35 DB-1 (databases): data integration: Organizing structured web sources by query schemas: a

clustering approach

Bin He, Tao Tao, Kevin Chen-Chuan Chang

November 2004

Proceedings of the thirteenth ACM international conference on Information and knowledge management CIKM '04

Publisher: ACM Press

Full text available: [pdf\(323.72 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

In the recent years, the Web has been rapidly "deepened" with the prevalence of databases online. On this deep Web, many sources are *<i>structured</i>* by providing structured query interfaces and results. Organizing such structured sources into a domain hierarchy is one of the critical steps toward the integration of heterogeneous Web sources. We observe that, for structured Web sources, query schemas *<i>ie</i>*, attributes in query interfaces) are discriminative representative ...

Keywords: data integration, deep Web, hierarchical agglomerative clustering

36 Research session: integration and mapping #1: Information preserving XML schema embedding

Philip Bohannon, Wenfei Fan, Michael Flaster, P. P. S. Narayan

August 2005

Proceedings of the 31st international conference on Very large data bases VLDB '05

Publisher: VLDB Endowment

Full text available: [pdf\(241.56 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A fundamental concern of information integration in an XML context is the ability to *embed* one or more source documents in a target document so that (a) the target document conforms to a target schema and (b) the information in the source document(s) is *preserved*. In this paper, information preservation for XML is formally studied, and the results of this study guide the definition of a novel notion of *schema embedding* between two XML DTD schemas represented as graphs. Schem ...

37 XML: Schemapath, a minimal extension to xml schema for conditional constraints

Claudio Sacerdoti Coen, Paolo Marinelli, Fabio Vitali

May 2004

Proceedings of the 13th international conference on World Wide Web

Publisher: ACM Press

Full text available: [pdf\(198.40 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In the past few years, a number of constraint languages for XML documents has been proposed. They are cumulatively called *schema languages* or validation languages and they comprise, among others, DTD, XML Schema, RELAX NG, Schematron, DSD, xlinkit. One major point of discrimination among schema languages is the support of co-constraints, or co-occurrence constraints, e.g., requiring that attribute A is present if and only if attribute B is (or is not) present in the same element. Although ...

Keywords: co-constraints, schema languages, schemapath, xml

38 Model independent assertions for integration of heterogeneous schemas

Stefano Spaccapietra, Christine Parent, Yann Dupont

July 1992

The VLDB Journal — The International Journal on Very Large Data Bases, Volume 1 Issue 1

Publisher: Springer-Verlag New York, Inc.

Full text available: [pdf\(2.15 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Due to the proliferation of database applications, the integration of existing databases into a distributed or federated system is one of the major challenges in responding to enterprises' information requirements. Some proposed integration techniques aim at providing database administrators (DBAs) with a view definition language they can use to build the desired integrated schema. These techniques leave to the DBA the responsibility of appropriately restructuring schema elements from existing I ...

Keywords: conceptual modeling, database design and integration, distributed databases, federated databases, heterogeneous databases, schema integration

39 A schema for interprocedural modification side-effect analysis with pointer aliasing

Barbara G. Ryder, William A. Landi, Philip A. Stocks, Sean Zhang, Rita Altucher

March 2001

ACM Transactions on Programming Languages and Systems (TOPLAS), Volume 23 Issue 2

Publisher: ACM Press

Full text available: [pdf\(1.72 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The first interprocedural modification side-effects analysis for C (MODC) that obtains better than worst-case precision on programs with general-purpose pointer usage is presented with empirical results. The analysis consists of an algorithm schema corresponding to a family of MODC algorithms with two independent phases: one for determining pointer-induced aliases and a subsequent one for propagating interprocedural ...

40 [Comparative analysis of six XML schema languages](#)



Dongwon Lee, Wesley W. Chu

September 2000 **ACM SIGMOD Record**, Volume 29 Issue 3

Publisher: ACM Press

Full text available: pdf(305.98 KB)

Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)



As XML [5] is emerging as *the* data format of the internet era, there is an substantial increase of the amount of data in XML format. To better describe such XML data structures and constraints, several XML schema languages have been proposed. In this paper, we present a comparative analysis of six noteworthy XML schema languages.

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